

Application No. 10/656,324  
AMENDMENT B dated July 25, 2005  
Reply to Office Action of January 25, 2005

#### **REMARKS**

Upon entry of the instant Amendment, Claims 1-22 are pending in the above-captioned application. In the Office Action, the drawings were objected to under 37 CFR §1.83(a) and claims 1 and 4 were objected to for various informalities. Claims 1 and 7 were rejected under 35 U.S.C. §112, second paragraph, and claims 2-6 were identified as being allowable if rewritten in independent form and amended to overcome any 35 U.S.C. §112 rejections attributable to claim 1. For convenience, Applicants will address each of these objections/rejections separately below.

#### **I. Allowable Subject Matter**

Applicants note with appreciation the determination that claims 2-6 contain allowable subject matter and would be allowable if rewritten in independent form and amended to overcome any 35 U.S.C. §112, second paragraph, rejections attributable to claim 1. (See Office Action, p. 4). Applicants also note with appreciate the determination that claim 1 contains allowable subject matter and would be allowable if re-written to overcome the 35 U.S.C. §112 rejections.

Applicants have amended independent claim 1 to overcome the rejection under 35 U.S.C. §112, second paragraph, and submit that claims 1-6 are in condition for allowance for the reasons specified below in Section IV. As these amendments have slightly changed the wording of claim 1, and specifically the language cited in the reasons for allowance, Applicants will not address the specific statement of reasons for allowance until a Notice of Allowance or further correspondence from the USPTO are received.

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AMENDMENTS TO THE DRAWINGS

The attached drawing sheet includes changes to FIG. 2 and is meant to replace the original sheet including FIG. 2. In the attached drawing sheet, the duplicate occurrence of reference numeral "41" in FIG. 2 has been changed to "42" in order to identify the worm gear identified in claim 1, line 9.

Attachments:                      Replacement Sheet of Drawings including FIG. 2;  
   Annotated Sheet of Drawings including FIG. 2.

## **II. Drawing Objections Under 37 C.F.R. §1.83(a)**

In the Office Action, the drawings were objected to under 37 C.F.R. §1.83(a) because they fail to show each and every feature of the invention specified in the claims. More particularly, the drawings were objected to because they failed to show the “worm” identified in claim 1, line 9.

Applicants have amended the second drawing sheet containing FIG. 2, in order to replace the duplicate occurrence of reference numeral “41” in FIG. 2 with reference numeral “42” and clarify that the worm identified in claim 1, line 9 is indeed shown in the drawings. Support for this amendment may be found throughout the specification and drawings, and in particular, at paragraphs 19, 20, 23, 28 and 29 of the Substitute Specification submitted along with the October 28, 2004 Preliminary Amendment and in FIGS. 2, 4 and 8 of the drawings.

Thus, Applicants submit that the drawings are in condition for acceptance and such acceptance is respectfully requested herein.

## **III. Objections to Claims 1 and 4 for Informalities.**

In the Office Action, claims 1 and 4 were objected for various informalities. More particularly, claim 1 was objected to for specifying “atop” rather than “a stop” and claim 4 was objected to because the phrase “is shaped a plate” was unclear. Applicants have amended claim 1 to change “atop” to “a stop” and note that the October 28, 2004 Preliminary Amendment inadvertently corrected this error without showing the change that had been made. Thus, the correction is shown in the amendments to the claims illustrated herein. Support for this amendment may be found throughout the application, and in particular, in the title of the application and on pages 1-7 of the specification.

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In the October 28, 2004 Preliminary Amendment, Applicants corrected claim 4 to clarify that the "lower connecting rod is shaped like a plate" rather than "shaped a plate." Support for this amendment may be found throughout the application, and in particular, in paragraph 21 of the Substitute Specification submitted along with the October 28, 2004 Preliminary Amendment and in FIG. 5 of the drawings.

Thus, Applicants submit that the objections to claims 1 and 4 have been addressed and respectfully request reconsideration and allowance of these claims. Applicants further note that the amendments to claims 1 and 4 are neither narrowing amendments nor amendments made for the purposes of patentability. Therefore, no equivalences are intended to be surrendered by the making of these amendments.

#### **IV. Rejections Under 35 U.S.C. §112, Second Paragraph**

In the Office Action, claims 1 and 7 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applications regard as their invention. More particularly, claim 1 was rejected because the phrases "at one side" and "a preset part" were not clear and claim 7 was rejected because there was no antecedent basis for the term "said multiple row teeth."

Applicants have amended claim 1 to delete the phrases "at one side" and "a preset part" in order to clarify what is being claimed in claim 1. Support for these amendments may be found throughout the application, and in particular, in paragraphs 15-33 of the Substitute Specification accompanying the October 28, 2004 Preliminary Amendment and in FIGS. 1-8.

With respect to claim 7, Applicants note that the October 28, 2004 Preliminary Amendment amended claims 1 and 7 to remove references to "multiple

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row teeth." This amendment appears to address the antecedent basis issues raised in the Office Action.


Thus, Applicants submit that the rejections of claims 1 and 7 have been overcome and respectfully request reconsideration and allowance of these claims. Applicants further note that the amendments to claims 1 and 7 are neither narrowing amendments nor amendments made for the purposes of patentability. Therefore, no equivalences are intended to be surrendered by the making of these amendments.

#### V. Conclusion

In view of the foregoing, Applicants submit that claims 1-22 are patentable over the cited references and hereby respectfully request reconsideration and allowance of claims 1-22.

Respectfully submitted,  
FITCH, EVEN, TABIN & FLANNERY

Dated: July 25, 2005

  
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Enclosures

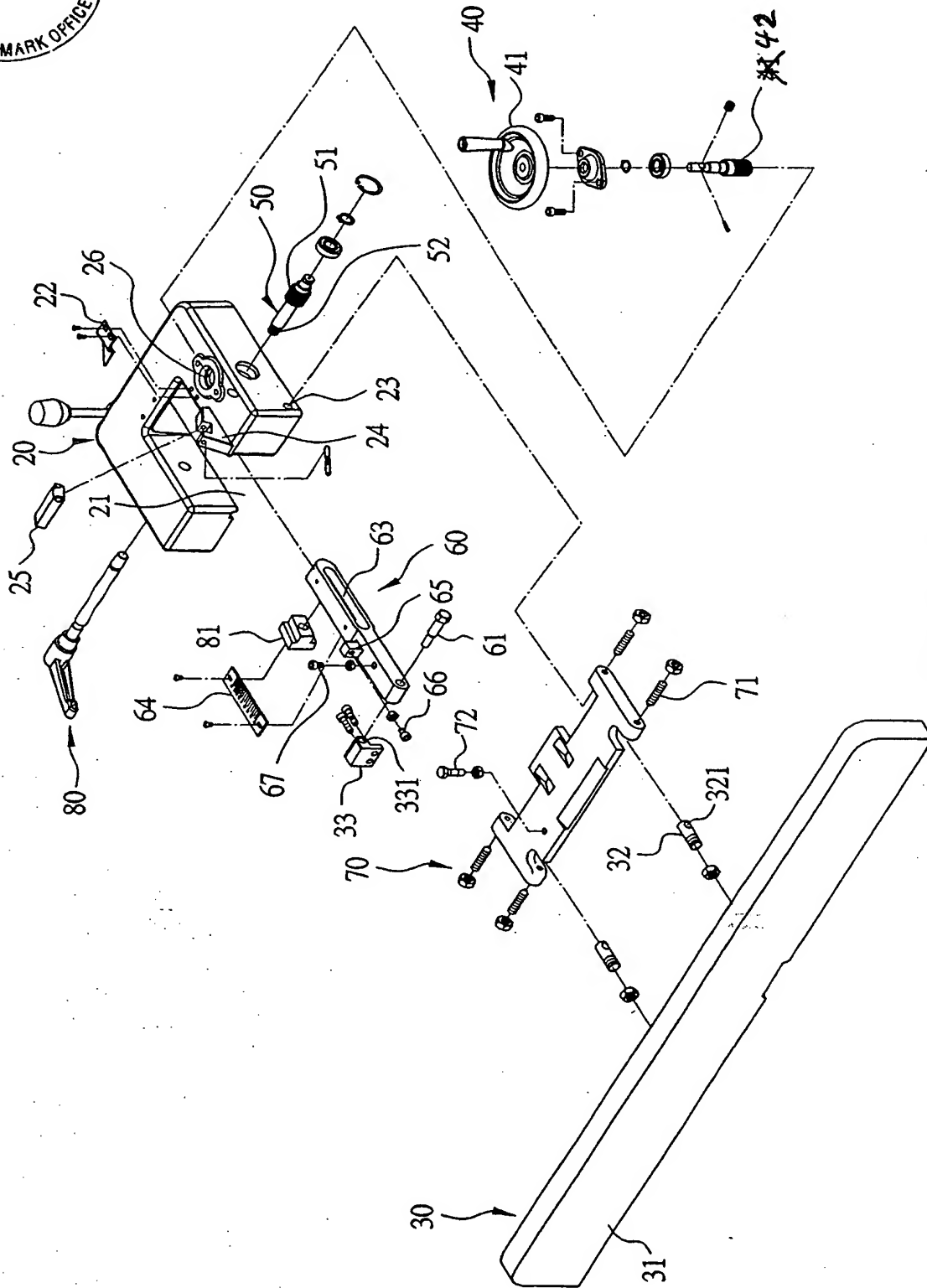
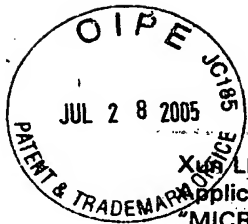


FIG. 2



**BEST AVAILABLE COPY**

Xun LEI et al.

Application No. 10/656,324, Filed September 8, 2003

"MICRO-ADJUSTMENT DEVICE FOR THE STOP  
PLANK OF A POWER TOOL"

Art Unit 3725

EEC:sh  
10/28/2004  
7203/82350

AMENDMENT TRANSMITTAL (2 pp, in duplicate)  
CORRECTION REGARDING SMALL ENTITY STATUS (2 pp, in duplicate)  
INFORMATION DISCLOSURE STATEMENT (2 pp)  
FORM PTO/SB/08b (1 Sheet, 1 document)  
PRELIMINARY AMENDMENT (9 pp) with attached SUBSTITUTE SPECIFICATION (7 pp),  
MARKED UP COPY OF SUBSTITUTE SPECIFICATION (8 pp),  
SUBSTITUTE ABSTRACT (1 p); MARKED UP COPY OF ABSTRACT (1 p)  
CHARGE DEPOSIT ACCOUNT: \$415.00 - Deficiency in Basic Filing Fee  
36.00 - Fee for claims in excess of twenty

**Hon. Commissioner of Patents and Trademarks**

**Sir:**

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*Respectfully,*

**FITCH, EVEN, TABIN & FLANNERY**

Xun LEI et al.

Application No. 10/656,324, Filed September 8, 2003

"MICRO-ADJUSTMENT DEVICE FOR THE STOP  
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MARKED UP COPY OF SUBSTITUTE SPECIFICATION (8 pp),  
SUBSTITUTE ABSTRACT (1 p); MARKED UP COPY OF ABSTRACT (1 p)  
CHARGE DEPOSIT ACCOUNT: \$415.00 - Deficiency in Basic Filing Fee  
36.00 - Fee for claims in excess of twenty

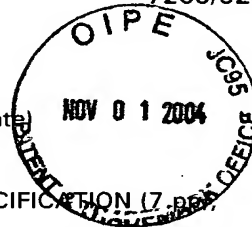
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*Respectfully,*

**FITCH, EVEN, TABIN & FLANNERY**



**COPY**



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Appin No.: 10/656,324  
Filed: September 8, 2003  
Applicants: Xun LEI et al.  
Title: MICRO-ADJUSTMENT DEVICE  
FOR THE STOP PLANK OF A  
POWER TOOL  
Art Unit: 3725  
Examiner: Not yet assigned

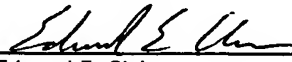
Attorney Docket No.: 7203/82350  
Customer No.: 22242

**Confirmation No. 9202**

**CERTIFICATE OF MAILING**

I hereby certify that this paper is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this date.

10/28/2004  
Date

  
Edward E. Clair  
Registration No. 51,565  
Attorney for Applicant(s)

Mail Stop AMENDMENT  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**COPY**

Sir:

Transmitted herewith is an amendment/reply in the above-identified application.

- ☒ A Correction Regarding Small Entity Status is enclosed.
- ☒ An Information Disclosure Statement and Form PTO/SB/08b is enclosed.
- ☒ A Preliminary Amendment is enclosed with a Substitute Specification and Abstract and a Marked Up Copy of Specification and Abstract.
- ☐ No additional fee is required.

**Fee Calculation For Claims As Amended**

	As Amended	Previously Paid For	Present Extra	Rate	Additional Fee
Independent Claims	3	3	** = 0	x \$ 88.00	= \$ 0.00
Total Claims	22	20	* = 2	x \$ 18.00	= \$ 36.00
Fee for Multiply Dependent Claims				\$ 300.00	\$ 0.00
** At least 3			Total Additional Fee		\$ 36.00
* At least 20					

Application No. 10/656,324  
Filed September 8, 2003  
Preliminary Amendment dated October 28, 2004

☐ Applicant(s) assert entitlement to Small Entity Status  
(37 C.F.R. § 1.27), thus reducing the fee by half to: \_\_\_\_\_

☐ A check in the amount of \$\_\_\_\_\_ is enclosed.

☒ Charge \$ 36.00 to Deposit Account No. 06-1135.

☒ The Commissioner is hereby authorized to charge any additional fees which may be required in this application under 37 C.F.R. §§1.16-1.17 during its entire pendency, or credit any overpayment, to Deposit Account No. 06-1135. Should no proper payment be enclosed herewith, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 06-1135. A duplicate copy of this sheet is enclosed.

October 28, 2004

Date



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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Appln No.: 10/656,324

Filed: September 8, 2003

Applicants: Xun LEI et al.

Title: MICRO-ADJUSTMENT DEVICE  
FOR THE STOP PLANK OF A  
POWER TOOL

Art Unit: 3725

Examiner: Not yet assigned

Attorney Docket No.: 7203/82350

Customer No.: 22242

**Confirmation No. 9202**

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10/28/2004

Date

Edward E. Clair

Registration No. 51,565

Attorney for Applicant(s)

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NOV 03 2004

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Mail Stop AMENDMENT  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

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**CORRECTION REGARDING SMALL ENTITY STATUS**

Sir:

Pursuant to 37 C.F.R. § 1.28(c), Applicants hereby notify the United States Patent and Trademark Office that small entity status was established in the above-identified application in error. This error occurred without any deceptive intent. The following is a calculation of the deficiency owed to the USPTO for this application:

Application No. 10/656,324

Filed September 8, 2003

CORRECTION REGARDING SMALL ENTITY STATUS dated October 28, 2004

Type of Fee	Current Fee Amount (for other than a Small Entity)	Previous Erroneous (Small Entity) Fee Payment and Date of Same
Basic Statutory Filing Fee	\$790.00	\$375.00 paid on 9/8/2003
<b>Total Deficiency</b>		<b>\$415.00</b>


The Commissioner is hereby authorized to charge the deficiency of \$415.00 to Deposit Account No. 06-1135. A duplicate copy of this document is enclosed.

The Commissioner is also hereby authorized to charge any additional fees which may be required in this application under 37 C.F.R. §§1.16-1.17 during its entire pendency, or credit any overpayment, to Deposit Account No. 06-1135.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

Dated: October 28, 2004

  
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Appln No.: 10/656,324

Filed: September 8, 2003

Applicants: Xun LEI et al.

Title: MICRO-ADJUSTMENT DEVICE  
FOR THE STOP PLANK OF A  
POWER TOOL

Art Unit: 3725

Examiner: Not yet assigned

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Commissioner for Patents  
P.O. Box 1450  
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**Confirmation No. 9202**

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10/28/2004

Date

Edward E. Clair

Registration No. 51,565

Attorney for Applicant(s)

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NOV 03 2004

BY: B. G.

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**PRELIMINARY AMENDMENT**

Sir:

This Amendment is being filed prior to the receipt of a first Office Action in the above-captioned application. Please amend the application as follows:

**Amendments to the Specification and Abstract** begin on page 2 of this paper and include both an attached substitute specification and abstract and a marked up copy of the substitute specification and abstract.

**Amendments to the Claims** are reflected in the listing of claims which begin on page 3 of this paper.

**Remarks/Arguments** begin on page 9 of this paper.

Application No. 10/656,324

Filed September 8, 2003

PRELIMINARY AMENDMENT dated October 28, 2004

**AMENDMENTS TO THE SPECIFICATION**

Due to the number and nature of the amendments made to the specification and abstract, Applicants hereby submit a substitute specification and abstract for the Examiner's review. The substitute specification and abstract include no new matter and should be used in place of the previous versions of the specification and abstract, which Applicants respectfully request be canceled.

For the Examiner's convenience, marked up versions of the substitute specification and abstract are attached showing all the changes made thereto.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

I CLAIM WHAT IS CLAIMED IS:

1. (Currently amended) A micro-adjusting device for the angle stop plank of a planer comprising:

a wood conveying table, said wood conveying table connected with a holding frame at one side, said holding frame connected with a stop plank, said stop plank positioned at one side on the ~~topside~~ top side of said wood conveying table for positioning a wood material, and ~~characterized by~~ further comprising:

[[A]] a hand wheel unit composed of a hand wheel and a worm, said worm actuated by said hand wheel to rotate, said worm ~~vertically~~ inserted in a preset part of said holding frame[:];

[[A]] a transmission rod ~~transversely~~ inserted in a preset part of said holding frame, said transmission rod having one end formed with a worm wheel, said worm wheel meshed with said worm of said hand wheel unit, said transmission rod having the other end formed with a transmission gear[:];

[[An]] an upper connecting rod having its front end pivotally connected with a preset part on the rear wall of said stop plank, said upper connecting rod having its rear end formed with a guiding groove, said guiding groove having its upper edge provided with multiple [[row]] teeth, said multiple [[row]] teeth meshed with said transmission gear of said transmission rod[:];

[[A]] a lower connecting rod having its rear end pivotally connected with said holding frame, said lower connecting rod having its front end pivotally connected with said stop plank[:]; and

[[Said]] said hand wheel turned to actuate said upper connecting rod to move back and forth through said worm, said upper connecting rod pulling or pushing said stop plank, said stop plank able to be freely adjusted and positioned at a required angle by the turning fulcrums respectively formed at the front and the rear pivotal joint of said lower connecting rod.

2. (Currently Amended) The micro-adjusting device for the angle stop plank of a planer as claimed in Claim 1, wherein said holding frame has an accommodating space formed in the center for receiving said upper connecting rod therein and a locking handle ~~transversely and pivotally~~ inserted in the opposite side of said transmission rod, said locking handle having its end ~~screwed with~~ connected to a lock block, said ~~locking block lock~~ fitted ~~and limited to rotate~~ in the opposite side of said guiding groove of said upper connecting rod, said ~~locking block lock~~ able to tighten or release said upper connecting rod when said locking handle is ~~turned around~~ actuated.

3. (Currently amended) The micro-adjusting device for the angle stop plank of a planer as claimed in Claim 1, wherein said holding frame is formed integral with a stop base protruding upward on one side generally abutting said upper connecting rod, and said stop base has a stop block pivotally provided thereon, said stop block able to be turned inward and positioned on said upper connecting rod in due time, said upper connecting rod provided with a bolt base protruding upward at a preset part on the ~~topside~~ top side and a stop bolt ~~screwed~~

~~on~~ connected to said bolt base, said stop plank able to be quickly adjusted and positioned at a right angle when said stop bolt and said stop block push against each other.

4. (Currently amended) The micro-adjusting device for the angle stop plank of a planer as claimed in Claim 1, wherein said lower connecting rod is shaped like a plate having a stop bolt ~~screwed~~ positioned at a preset location on the ~~topside~~ top side, said stop bolt ~~exactly~~ pushing against a preset part on the rear wall of said stop plank when said stop plank is adjusted, thus said stop plank able to be quickly adjusted and positioned at an exterior angle of 45 degrees.

5. (Currently amended) The micro-adjusting device for the angle stop plank of a planer as claimed in Claim 1, wherein said upper connecting rod has a stop bolt ~~screwed~~ positioned at a preset location on the ~~topside~~ top side, said stop bolt ~~exactly~~ pushing against a preset part on the ~~topside~~ top side of said lower connecting rod when said stop plank is adjusted, thus said stop plank able to be quickly adjusted and positioned at an interior angle of 45 degrees.

6. (Currently amended) The micro-adjusting device for the angle stop plank of a planer as claimed in Claim 1, wherein said upper connecting rod has the ~~topside~~ top side above said guiding groove provided with a ~~graduation~~ graduated ruler having angle graduations marked thereon, and said holding frame has its ~~topside~~ top side provided with an index hand pointing to said ~~graduation~~ graduated ruler to indicate a positioning angle of said stop plank after said stop plank is adjusted.

7. (Currently amended) The micro-adjusting device for the angle stop plank of a planer as claimed in Claim 1, wherein said multiple ~~[[row]]~~ teeth in said guiding groove of said upper connecting rod ~~[[is]]~~ form a rack directly fixed in said guiding groove from the upper side of said upper connecting rod.

8. (New) An adjustable stop plank for a power tool having a work surface, the adjustable stop plank further comprising:  
a drive mechanism connected to the stop plank for continuous adjustment of the angle of the stop plank with respect to the work surface within a predetermined range of angles; and  
an actuator for operating the drive mechanism to adjust the angle of the stop plank.

9. (New) An apparatus according to claim 8, wherein the drive mechanism has an interface with at least one tooth that allows the stop plank to be moved to different angles with respect to the work surface.

10. (New) An apparatus according to claim 8, wherein the drive mechanism includes components having a meshed interface which cooperate to adjust the angle of the stop plank.

11. (New) An apparatus according to claim 8, wherein the drive mechanism has a threaded interface that allows the stop plank to be moved to different angles with respect to the work surface.

12. (New) An apparatus according to claim 11, wherein the threaded interface comprises a worm gear having a worm driven by the actuator, the worm engages a wheel connected to the stop plank so that movement of the actuator will adjust the angle of the stop plank.

13. (New) An apparatus according to claim 8, wherein the actuator is hand operated to adjust the angle of the stop plank.

14. (New) An apparatus according to claim 11, wherein the hand operated actuator is a spindle movable in a clockwise direction to adjust the angle of the stop plank in a first direction and movable in a counterclockwise direction to adjust the angle of the stop plank in a second direction.

15. (New) An apparatus according to claim 8, further comprising at least one stop to obstruct movement of the stop plank beyond at least one predetermined angle.

16. (New) An apparatus according to claim 15, wherein the at least one stop comprises an adjustable hinderer which may be adjusted to obstruct movement of the stop plank beyond the at least one predetermined angle.

17. (New) An apparatus according to claim 15, wherein the at least one stop comprises an adjustable bolt that obstructs movement of the stop plank beyond a predetermined angle.

18. (New) An apparatus according to claim 8, wherein the actuator may be rotated in a clockwise or counterclockwise direction to make micro-adjustments to the angle of the stop plank.

19. (New) An apparatus according to claim 8, further comprising a display for indicating the current angle of the stop plank.

20. (New) An apparatus according to claim 19, wherein the display comprises:

indicia to indicate a plurality of angles for the stop plank; and  
an index for indicating on the indicia the current angle of the stop plank.

21. (New) A planar comprising:  
a base having a workpiece support table and an adjustable stop plank for positioning a workpiece; and  
a display for indicating the current angle of the stop plank with respect to the workpiece support table.

22. (New) An apparatus according to claim 21 wherein the display further comprises:

indicia to indicate a plurality of angles for the stop plank; and  
an index for indicating on the indicia the current angle of the stop plank.

Application No. 10/656,324  
Filed September 8, 2003  
PRELIMINARY AMENDMENT dated October 28, 2004

REMARKS


Upon entry of the instant Amendment, Claims 1-22 are pending in the above-captioned application.

The specification has been amended to correct a plurality of grammatical errors made therein. The claims have been amended to broaden the language used therein and to add new Claims 8-22. Support for these amendments may be found throughout the specification and, in particular, in drawing Figures 1-8. Applicants note that none of the amendments made herein are being made for purposes of patentability or to narrow the scope of the claims, thus no equivalents are intended to be surrendered by the making of such amendments. The abstract and title have also been amended to reflect the amendments to the claims.

Applicants submit that no new matter has been added to the application and respectfully request entry of the above amendments and examination and allowance of claims 1-22 as amended.

Respectfully submitted,  
FITCH, EVEN, TABIN & FLANNERY

Dated: October 28, 2004

  
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Enclosures

**SUBSTITUTE SPECIFICATION**

COPY



## MICRO-ADJUSTMENT DEVICE FOR THE STOP PLANK OF A POWER TOOL

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

[0001] This invention relates to a micro-adjustment device for the angle stop plane of a planer, particularly to one able to micro-adjust the slanting angles of the angle stop plank of a planer accurately and quickly.

#### 2. Description of the Prior Art

[0002] A conventional planer has a stop plank positioned stationary on its wood conveying table, always maintaining a single angle between the stop plank and the wood conveying table; therefore after a wood material is positioned to lean on the stop plank for planing, it can be planed only at a single angle, making it impossible to be planed at a specific angle. To carry out planing at a specific angle, it is necessary to draw a line on the wood material in advance and then perform planing with the help of certain auxiliary tools, and is impossible to plane the wood material with great accuracy, making it inconvenient in performing planing work.

[0003] In view of the above-mentioned drawback, another conventional planer is provided with an adjustable stop plank which can be adjusted and positioned at frequently employed angles, such as an interior angle of 45 degrees, a right angle or an exterior angle of 45 degrees, which is able to carry out planing at a specific angle safely and conveniently. However, although the stop plank of the conventional planer can be adjusted and positioned at certain specific angles, yet such a design cannot fully meet the needs in planing work because many wood materials may be required to be planed at other different angles rather than at the aforesaid specific angles.

COPY

## SUMMARY OF THE INVENTION

[0004] A main objective of the invention is to offer a micro-adjustment device for the angle stop plank of a planer, able to accurately micro-adjust the stop plank of a planer at any angle from an interior angle of 45 degrees to an exterior angle of 45 degrees by turning around a hand wheel.

[0005] Another objective of the invention is to offer a micro-adjustment device for the angle stop plank of a planer, able to have the angle stop plank accurately and quickly adjusted at one of frequently employed specific angles, such as an interior angle of 45 degrees, a right angle and an exterior angle of 45 degrees without help of a graduation ruler.

## BRIEF DESCRIPTION OF DRAWINGS

[0006] This invention will be better understood by referring to the accompanying drawings, wherein:

[0007] Fig. 1 is a partial perspective view of a micro-adjustment device for the angle stop plank of a planer in the present invention;

[0008] Fig. 2 is an exploded perspective view of the micro-adjustment device for the angle stop plank of a planer in the present invention;

[0009] Fig. 3 is a top view of the micro-adjustment device for the angle stop plank of a planer in the present invention;

[0010] Fig. 4 is a bottom view of the micro-adjustment device for the angle stop plank of a planer in the present invention;

[0011] Fig. 5 is a perspective view of the upper connecting rod of the micro-adjustment device for the angle stop plank of a planer in the present invention;

[0012] Fig. 6 is a cross-sectional view of the micro-adjustment device for the angle stop plank of a planer in the present invention, showing the angle stop plank adjusted and positioned at a right angle;

[0013] Fig. 7 is a cross-sectional view of the micro-adjustment device for the angle stop plank of a planer in the present invention, showing the angle stop plank adjusted and positioned at an exterior angle of 45-degrees; and

[0014] Fig. 8 is a cross-sectional view of the micro-adjustment device for the angle stop plank of a planer in the present invention, showing the angle stop plank adjusted and positioned at an interior angle of 45-degrees.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0015] A preferred embodiment of a micro-adjustment device for the angle stop plank of a planer in the present invention, as shown in Figs. 1 to 4, includes a wood-conveying table 10, a holding frame 20, a stop plank 30, a hand wheel unit 40, a transmission rod 50, an upper connecting rod 60, a lower connecting rod 70 and a locking handle 80 combined together.

[0016] The wood-conveying table 10 has one side combined with the upper holding frame 20 connected with the stop plank 30, which is located at one side on the top side of the wood-conveying table 10 for a wood material to be leaned thereon during planing.

[0017] The holding frame 20 has an inverted U-shaped body, having an accommodating space 21 formed in the center, and an index hand 22 provided at a preset location of the top side and pointing to one side of the accommodating space 21.

[0018] The stop plank 30 has its front side formed with a leaning surface 31 for a wood material to lean thereon and its rear lower side locked with two connecting bolts 32 separately positioned at preset locations and respectively having a lateral

insert hole 321. The stop plank 30 further has a rod-connecting base 33 with a lateral shaft hole 331 secured near the upper edge of its rear central wall.

[0019] The hand wheel unit 40 consists of a hand wheel 41 and a worm 42 actuated to rotate by the hand wheel 41. The worm 42 is vertically inserted in a through hole 26 in the top side of the holding frame 20.

[0020] The transmission rod 50 to be transversely inserted in the holding frame 20 and positioned at the lower end of the worm 42 of the hand wheel unit 40. The transmission rod 50 has one end provided with a worm wheel 51 to be meshed with the worm 42 and the other end formed with a transmission gear 52.

[0021] The upper connecting rod 60, as shown in Fig. 5, to be positioned in the accommodating space 21 of the holding frame 20, is provided with a bolt 61 at the front end to be inserted in the shaft hole 331 of rod-connecting base 33 fixed at the rear wall of the stop plank 30, and a rack 62 at the rear upper side, with a guiding groove 63 formed beneath the rack 62, which is formed with multiple row teeth 621 to be meshed with the transmission gear 52 of the transmission rod 50. Further, the upper connecting rod 60 has the top side above the guiding groove 63 provided with a graduated ruler 64 having angle graduations marked thereon. Thus, the graduated ruler 64 on the upper connecting rod 60 in cooperation with the index hand 22 on the holding frame 20 can indicate the positioning angle of the stop plank 30 after it is adjusted.

[0022] The lower connecting rod 70 is shaped like a plate and has two bolts 71 respectively provided at the opposite ends of its rear side to be respectively and pivotally inserted in two insert holes 23 at the opposite lower front sides of the holding frame 20, and another two bolts 71 respectively provided at the opposite ends of its front side to be respectively and pivotally inserted in the two insert holes 321 of the two connecting bolts 32 of the stop plank 30. Thus, the pivotal joints of the lower connecting rod 70 with the holding frame 20 and the stop plank 30 respectively make up a turning fulcrum.

[0023] The locking handle 80 is transversely and pivotally inserted in the left side of the holding frame 20 and positioned opposite to the worm 42. The locking handle 80 has its end screwed with a locking block 81 to be fitted in the opposite side of the guiding groove 63 of the upper connecting rod 60 and limited to rotate therein. Thus, when the locking handle 80 is turned and locked tightly, its locking block 81 will be actuated to push tightly against or release the upper connecting rod 60.

[0024] In addition, the micro-adjustment device of this invention is also provided with three positioning methods able to quickly position the stop plank at three specific angles:

[0025] 1. A positioning method of a right angle: Referring to Fig. 6, the holding frame 20 is formed integral with a stop base 24 protruding upward on one side abutting the upper connecting rod 60. The stop base 24 has a pivotal stop block 25 able to be rotated and positioned on the top side of the upper connecting rod 60 at times. The upper connecting rod 60 is provided with a bolt base 65 protruding upward at a preset location on the top side thereof and having a stop bolt 66 screwed therein. Thus, when the stop plank 30 is turned and adjusted, the stop bolt 66 of the upper connecting rod 60 and the stop block 25 of the holding frame 20 will push against each other and quickly position the stop plank 30 at the angle of 90 degrees.

[0026] 2. A positioning method of an exterior angle of 45 degrees: Referring to Fig. 7, the lower connecting rod 70 is provided with a stop bolt 72 at a preset location on the top side thereof. Thus, when the stop plank 30 is turned and adjusted, the stop bolt 72 of the lower connecting rod 70 will push against a preset part on the rear wall of the stop plank 30 and quickly position the stop plank 30 at the exterior angle of 45 degrees.

[0027] 3. A positioning method of an interior angle of 45 degrees: Referring to Fig. 8, the upper connecting rod 60 is provided with a stop bolt 67, in front of the

bolt base 65, on the top side thereof. Thus, when the stop plank 30 is turned and adjusted, the stop bolt 67 will push against a preset part on the top side of the lower connecting rod 70 and quickly position the stop plank 30 at the interior angle of 45 degrees.

[0028] In operating and using the micro-adjustment device, as shown in Figs. 6, 7 and 8, before the stop plank 30 is adjusted, the stop bolt 66 on the upper connecting rod 60 for positioning an angle of 90 degrees and the stop bolt 67 for positioning an exterior angle of 45 degrees and the stop bolt 72 on the lower connecting rod 70 for positioning an interior angle of 45 degrees are respectively screwed and adjusted to an accurate position. Thus, when the hand wheel 41 is turned around, the upper connecting rod 60 will be actuated by the worm 42 and the transmission rod 50 to pull or push the stop plank 30, and simultaneously the stop plank 30 will be turned in a specific direction by means of the turning fulcrums respectively formed at the pivotal joints at the front and the rear end of the lower connecting rod 70.

[0029] Specifically, to position the stop plank 30 at the interior angle of 45 degrees, the hand wheel 41 is turned in a proper direction to let its worm 42 actuate the worm wheel 51 of the transmission rod 50 to rotate. In the meantime, the transmission rod 50 rotates, having its transmission gear 52 actuate the row of teeth 621 together with the upper connecting rod 60 to move forward and push the stop plank 30 to force the upper portion of the stop plank 30 to slant outward until the stop bolt 67 adjusted in advance on the upper connecting rod 60 exactly pushes against the top side of the lower connecting rod 70, thus able to position the stop plank 30 at the interior angle of 45 degrees.

[0030] To position the stop plank 30 at the right angle, the stop block 25 on the holding frame 20 is pulled toward the upper connecting rod 60 and lies on the top side of the upper connecting rod 60. Then, the hand wheel 41 is turned counter-clockwise to let the row of teeth 621 of the upper connecting rod 60 actuated by the transmission gear 52 of the transmission rod 50 to move backward and pull the

stop plank 30 until the stop bolt 66 adjusted in advance on the upper connecting rod 60 exactly pushes against the stop block 25, thus able to position the stop plank 30 at the right angle.

[0031] To position the stop plank 30 at the exterior angle of 45 degrees, the stop block 25 of the holding frame 20 is pulled outward to enable the upper connecting rod 60 to move backward smoothly. Then, the hand wheel 41 is turned around to let the row of teeth 621 together with the upper connecting rod 60 actuated by the transmission gear 52 of the transmission rod 50 to move backward and pull the stop plank 30 until a preset part on the rear wall of the stop plank 30 exactly pushes against the stop bolt 72 on the top side of the lower connecting rod 70, thus able to position the stop plank 30 at an exterior angle of 45 degrees. The scope of the adjustable angle of the stop plank 30 is 90 degrees from the interior 45 degrees to the exterior 45 degrees.

[0032] Apart from being quickly positioned at the above-mentioned specific angles, the stop plank 30 can also be precisely micro-adjusted at any angle, as shown in Fig. 3. To micro-adjust the stop plank 30, the hand wheel 41 is turned around to actuate the upper connecting rod 60 to move back or forth and push or pull the stop plank 30 to control its slanting angle. As mentioned above, the holding frame 20 is provided thereon with the index hand 22 pointing to the graduated ruler 64 on the upper connecting rod 60; therefore when the hand wheel 41 is turned to micro-adjust the stop plank, the upper connecting rod 60 is moved back or forth according to the angle graduations indicated on the angle graduation ruler 64 by the index hand 22 so as to micro-adjust and position the stop plank 30 at an expected angle precisely and quickly.

[0033] While the preferred embodiment of the invention has been described above, it will be recognized and understood that various modifications may be made therein and the appended claims are intended to cover all such modifications that may fall within the spirit and scope of the invention.

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MICRO-ADJUSTMENT DEVICE  
FOR THE [[ANGLE]] STOP PLANK OF A PLANER POWER TOOL

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] This invention relates to a micro-adjustment device for the angle stop plane of a planer, particularly to one able to micro-adjust the slanting angles of the angle stop plank of a planer accurately and quickly.

2. Description of the Prior Art

[0002] A conventional planer has a stop plank positioned stationary on its wood conveying table, always maintaining a single angle between the stop plank and the wood conveying table; therefore after a wood material is positioned to lean on the stop plank for planing, it can be planed only at a single angle, making it impossible to be planed at a specific angle. To carry out planing at a specific angle, it is necessary to draw a line on the wood material in advance and then perform planing with the help of certain auxiliary tools, and is impossible to plane the wood material with great accuracy, making it inconvenient in performing planing ~~[[wok]] work and likely to cause danger during planing.~~

[0003] In view of the above-mentioned drawback, another conventional planer is provided with an adjustable stop plank which can be adjusted and positioned at frequently employed angles, such as an interior angle of 45 degrees, a right angle or an exterior angle of 45 degrees, which is able to carry out planing at a specific angle safely and conveniently. [[[0004] ]] However, although the stop plank of the conventional planer can be adjusted and positioned at certain specific angles, yet such a design cannot fully meet the needs in planing work because many wood materials may be required to be planed at other different angles rather than at the aforesaid specific angles.

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## SUMMARY OF THE INVENTION

[0004] A main objective of the invention is to offer a micro-adjustment device for the angle stop plank of a planer, able to accurately micro-adjust the stop plank of a planer at any angle from an interior angle of 45 degrees to an exterior angle of 45 degrees by turning around a hand wheel.

[0005] Another objective of the invention is to offer a micro-adjustment device for the angle stop plank of a planer, able to have the angle stop plank accurately and quickly adjusted at one of frequently employed specific angles, such as an interior angle of 45 degrees, a right angle and an exterior angle of 45 degrees without help of a graduation ruler.

## BRIEF DESCRIPTION OF DRAWINGS

[0006] This invention will be better understood by referring to the accompanying drawings, wherein:

[0007] Fig. 1 is a partial perspective view of a micro-adjustment device for the angle stop plank of a planer in the present invention[[:]] ;

[0008] Fig. 2 is an exploded perspective view of the micro-adjustment device for the angle stop plank of a planer in the present invention[[:]] ;

[0009] Fig. 3 is a top view of the micro-adjustment device for the angle [[stoop]] stop plank of a planer in the present invention[[:]] ;

[0010] Fig. 4 is a bottom view of the micro-adjustment device for the angle stop plank of a planer in the present invention[[:]] ;

[0011] Fig. 5 is a perspective view of the upper connecting rod of the micro-adjustment device for the angle stop plank of a planer in the present invention[[:]] ;

[0012] Fig. 6 is a cross-sectional view of the micro-adjustment device for the angle stop plank of a planer in the present invention, showing the angle stop plank adjusted and positioned at a right angle[[:]] ;

[0013] Fig. 7 is a cross-sectional view of the micro-adjustment device for the angle stop plank of a planer in the present invention, showing the angle stop plank adjusted and positioned at an exterior angle of 45-degrees[[:]] ; and

[0014] Fig. 8 is a cross-sectional view of the micro-adjustment device for the angle stop plank of a planer in the present invention, showing the angle stop plank adjusted and positioned at an interior angle of 45-degrees.

#### DETAILED ~~DESCRIPTION~~ DESCRIPTION OF THE PREFERRED EMBODIMENT

[0015] A preferred embodiment of a micro-adjustment device for the angle stop plank of a planer in the present invention, as shown in Figs. 1 to 4, includes a wood-conveying table 10, a holding frame 20, a stop plank 30, a hand wheel unit 40, a transmission rod 50, an upper connecting rod 60, a lower connecting rod 70 and a locking handle 80 combined together.

[0016] The wood-conveying table 10 has one side combined with the upper holding frame 20 connected with the stop plank 30, which is located at one side on the ~~topside~~ top side of the wood-conveying table 10 for a wood material to be leaned thereon during planing.

[0017] The holding frame 20 ~~[[is]]~~ has an ~~inverted-U-shaped~~ inverted U-shaped body, having an accommodating space 21 formed in the center, and an index hand 22 provided at a preset location of the ~~topside~~ top side and pointing to one side of the accommodating space 21.

[0018] The stop plank 30 has its front side formed with a leaning surface 31 for a wood material to lean thereon and its rear lower side locked with two connecting bolts 32 separately positioned at preset locations and respectively having a lateral

insert hole 321. The stop plank 30 further has a rod-connecting base 33 with a lateral shaft hole 331 secured near the upper edge of its rear central wall.

[0019] The hand wheel unit 40 consists of a hand wheel 41 and a worm 42 actuated to rotate by the hand wheel 41. The worm 42 is vertically inserted in a through hole 26 in the ~~topside~~ top side of the holding frame 20.

[0020] The transmission rod 50 to be transversely inserted in the holding frame 20 and positioned at the lower end of the worm 42 of the hand wheel unit 40. The transmission rod 50 has one end provided with a worm wheel 51 to be meshed with the worm 42 and the other end formed with a transmission gear 52.

[0021] The upper connecting rod 60, as shown in Fig. 5, to be positioned in the accommodating space 21 of the holding frame 20, is provided with a bolt 61 at the front end to be inserted in the shaft hole 331 of rod-connecting base 33 fixed at the rear wall of the stop plank 30, and a rack 62 at the rear upper side, with a guiding groove 63 formed beneath the rack 62, which is formed with multiple row teeth 621 to be meshed with the transmission gear 52 of the transmission rod 50. Further, the upper connecting rod 60 has the ~~topside~~ top side above the guiding groove 63 provided with a ~~graduation~~ graduated ruler 64 having angle graduations marked thereon. Thus, the ~~graduation~~ graduated ruler 64 on the upper connecting rod 60 in cooperation with the index hand 22 on the holding frame 20 can indicate the positioning angle of the stop plank 30 after it is adjusted.

[0022] The lower connecting rod 70 is shaped like a plate and has two bolts 71 respectively provided at the opposite ends of its rear side to be respectively and pivotally inserted in two insert holes 23 at the opposite lower front sides of the holding frame 20, and another two bolts 71 respectively provided at the opposite ends of its front side to be respectively and pivotally inserted in the two insert holes 321 of the two connecting bolts 32 of the stop plank 30. Thus, the pivotal joints of the lower connecting rod 70 with the holding frame 20 and the stop plank 30 respectively make up a turning fulcrum.

[0023] The locking handle 80 is transversely and pivotally inserted in the left side of the holding frame 20 and positioned opposite to the worm 42. The locking handle 80 has its end screwed with a locking block 81 to be fitted in the opposite side of the guiding groove 63 of the upper connecting rod 60 and limited to rotate therein. Thus, when the locking handle 80 is turned and locked tightly, its locking block 81 will be actuated to push tightly against or release the upper connecting rod 60.

[0024] In addition, the micro-adjustment device of this invention is also provided with three positioning methods able to quickly position the stop plank at three specific angles[[]] :

[0025] 1. A positioning method of a right angle: Referring to Fig. 6, the holding frame 20 is formed integral with a stop base 24 protruding upward on one side abutting the upper connecting rod 60. The stop base 24 ~~is pivotally provided with a~~ has a pivotal stop block 25 able to be rotated and positioned on the ~~topside~~ top side of the upper connecting rod 60 ~~in due time at times~~. The upper connecting rod 60 is provided with a bolt base 65 protruding upward at a preset location on the ~~topside~~ top side thereof and having a stop bolt 66 screwed ~~thereon~~ therein. Thus, when the stop plank 30 is turned and adjusted, the stop bolt 66 of the upper connecting rod 60 and the stop block 25 of the holding frame 20 will push against each other and quickly position the stop plank 30 at the angle of 90 degrees.

[0026] 2. A positioning method of an exterior angle of 45 degrees: Referring to Fig. 7, the lower connecting rod 70 is provided with a stop ~~[[blot]]~~ bolt 72 at a preset location on the ~~topside~~ top side thereof. Thus, when the stop plank 30 is turned and adjusted, the stop bolt 72 of the lower connecting rod 70 will push against a preset part on the rear wall of the stop plank 30 and quickly position the stop plank 30 at the exterior angle of 45 degrees.

[0027] 3. A positioning method of an interior angle of 45 degrees: Referring to Fig. 8, the upper connecting rod 60 is provided with a stop bolt 67, in front of the bolt base 65, on ~~[[its]]~~ the topside top side thereof. Thus, when the stop plank 30 is turned and adjusted, the stop bolt 67 will push against a preset part on the ~~topside~~ top side of the lower connecting rod 70 and quickly position the stop plank 30 at the interior angle of 45 ~~degree~~ degrees.

[0028] In operating and using the micro-adjustment device, as shown in Figs. 6, 7 and 8, before the stop plank 30 is adjusted, the stop bolt 66 on the upper connecting rod 60 for positioning an angle of 90 degrees and the stop bolt 67 for positioning an exterior angle of 45 degrees and the stop bolt 72 on the lower connecting rod 70 for positioning an interior angle of 45 degrees are respectively screwed and adjusted to an accurate position. Thus, when the hand wheel 41 is turned around, the upper connecting rod 60 will be actuated by the worm 42 and the transmission rod 50 to pull or push the stop plank 30, and simultaneously the stop plank 30 will be turned in a specific direction by means of the turning fulcrums respectively formed at the pivotal joints at the front and the rear end of the lower connecting rod 70.

[0029] Specifically, to position the stop plank 30 at the interior angle of 45 degrees, the hand wheel 41 is turned in a proper direction to let its worm 42 actuate the worm wheel 51 of the transmission rod 50 to rotate. In the meantime, the transmission rod 50 rotates, having its transmission gear 52 actuate the row of teeth 621 together with the upper connecting rod 60 to move forward and push the stop plank 30 to force the upper portion of the stop plank 30 to slant outward until the stop bolt 67 adjusted in advance on the upper connecting rod 60 exactly pushes against the ~~topside~~ top side of the lower connecting rod 70, thus able to position the stop plank 30 at the interior angle of 45 degrees.

[0030] To position the stop plank 30 at the right angle, the stop block 25 on the holding frame 20 is pulled toward the upper connecting rod 60 and lies on the ~~topside~~ top side of the upper connecting rod 60. Then, the hand wheel 41 is turned

counterclockwise to let the row of teeth 621 of the upper connecting rod 60 actuated by the transmission gear 52 of the transmission rod 50 to move backward and pull the stop plank 30 until the stop bolt 66 adjusted in advance on the upper connecting rod 60 exactly pushes against the stop block 25, thus able to position the stop plank 30 at the right angle.

[0031] To position the stop plank 30 at the exterior angle of 45 degrees, the stop block 25 of the holding frame 20 is pulled outward to enable the upper connecting rod 60 to move backward smoothly. Then, the hand wheel 41 is turned around to let the ~~row-teeth~~ row of teeth 621 together with the upper connecting rod 60 actuated by the transmission gear 52 of the transmission rod 50 to move backward and pull the stop plank 30 until a preset part on the rear wall of the stop plank 30 exactly pushes against the stop bolt 72 on the ~~topside~~ top side of the lower connecting rod 70, thus able to position the stop plank 30 at an exterior angle of 45 degrees. The scope of the adjustable angle of the stop plank 30 is 90 degrees from the interior 45 degrees to the exterior 45 degrees.

[0032] Apart from being quickly positioned at the above-mentioned specific angles, the stop plank 30 can also be precisely micro-adjusted at any angle, as shown in Fig. 3. To micro-adjust the stop plank 30, the hand wheel 41 is turned around to actuate the upper connecting rod 60 to move back or forth and push or pull the stop plank 30 to control its slanting angle. As mentioned above, the holding frame 20 is provided thereon with the index hand 22 pointing to the ~~graduation~~ graduated ruler 64 on the upper connecting rod 60; therefore when the hand wheel 41 is turned to micro-adjust the stop plank, the upper connecting rod 60 is moved back or forth according to the angle graduations indicated on the angle graduation ruler 64 by the index hand 22 so as to micro-adjust and position the stop plank 30 at an expected angle precisely and quickly.

[0033] While the preferred embodiment of the invention has been described above, it will be recognized and understood that various modifications may be

made therein and the appended claims are intended to cover all such modifications that may fall within the spirit and scope of the invention.

**SUBSTITUTE ABSTRACT**

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## ABSTRACT OF THE INVENTION

An adjustable stop plank for a power tool includes a drive mechanism connected to the stop plank for continuous adjustment of the angle of the stop plank with respect to the work surface and has a display for indicating the current angle of the stop plank. In one form, the micro-adjusting device for the stop plank of a power tool includes a hand wheel unit provided on the holding frame operable to continuously adjust the angle of the stop plank. The power tool may include indicia to indicate a plurality of angles for the stop plank and an index for indicating on the indicia the current angle of the stop plank.

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## ABSTRACT OF THE INVENTION

An adjustable stop plank for a power tool includes a drive mechanism connected to the stop plank for continuous adjustment of the angle of the stop plank with respect to the work surface and has a display for indicating the current angle of the stop plank. In one form, the [[A]] micro-adjusting device for the [[angle]] stop plank of a ~~planer~~ power tool includes a hand wheel unit provided on the holding frame and having a worm, a transmission rod provided in the holding frame to be rotated by the worm, an upper connecting rod meshed with and actuated to move back and forth by a transmission gear fixed on one end of the transmission rod and having one end pivotally connected with a stop plank, and a lower connecting rod having its opposite ends respectively connected pivotally with the stop plank and the holding frame to form two pivotal joints serving as turning fulcrums. When the hand wheel unit is turned around, the upper connecting rod is actuated to pull or push the upper portion of the stop plank, and the lower connecting rod together with the turning fulcrums micro-adjusts the stop plank at a required angle operable to continuously adjust the angle of the stop plank. The power tool may include indicia to indicate a plurality of angles for the stop plank and an index for indicating on the indicia the current angle of the stop plank.

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